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(72) Inventor: **Piretti, Giancarlo**  
**40137 Bologna (IT)**

(74) Representative: **Marchitelli, Mauro et al**  
**Buzzi, Notaro & Antonielli d'Oulx Srl,**  
**Corso Flume 6**  
**10133 Torino (IT)**

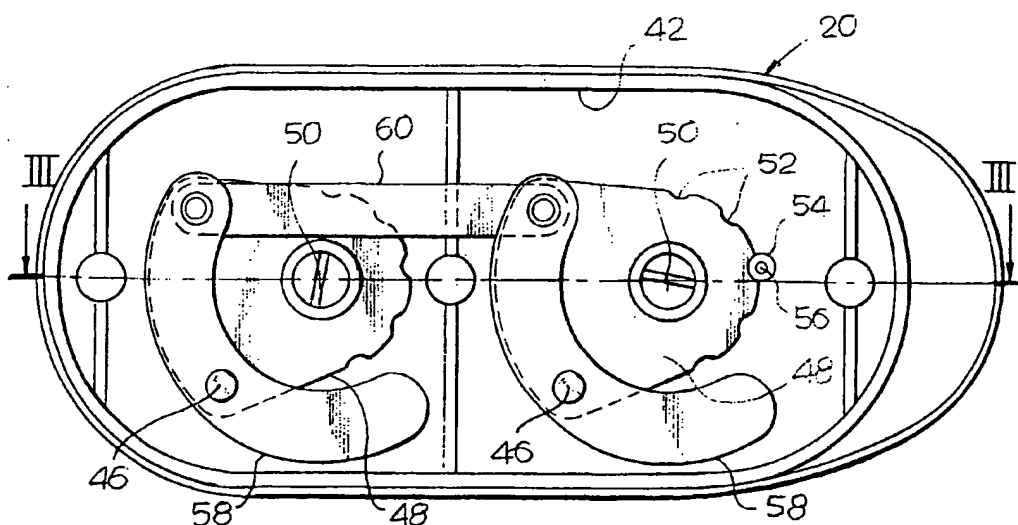
(71) Applicant: **Desital Holland B.V.**  
**1103 RA Amsterdam Z.O. (NL)**

(54) **Chair arm-rest**

(57) A chair arm-rest, comprising a supporting structure (18), an arm-rest body (20), and articulation means which connect the arm-rest body (20) to the supporting structure (18). Said articulation means comprise a first pair of articulation axes (46) carried by the supporting structure (18), a second pair of articulation axes (50)

carried by the arm-rest body (20) and a pair of articulation members (48) operatively associated with the first and second pair of articulation axes (46, 50) so as to form an articulated quadrilateral device which enables the arm-rest body (20) to move in a lateral direction to the user.

*Fig. 2*



## Description

[0001] The present invention relates to a chair arm-rest of the type comprising a supporting structure, an arm-rest body, and articulation means for movably connecting the arm-rest body to the supporting structure.

[0002] A variety of chair arm-rests are known, including an adjustable component movable between various positions. One of the most common needs is to adjust laterally the position of the arm-rests so that they can be brought closer to or moved away from the body of the user for providing ergonomic rest positions adapted to the needs of the user. In a known solution, the arm-rest is articulated about a vertical axis so that it can be rotated both inwardly and outwardly for providing rest positions closer to or farther away from the body of the user. A drawback of this solution is that the rest surface varies as a function of the position of the arm-rest. From the ergonomic point of view, it would be desirable to have an adjustable arm-rest which maintains the same rest surface in the various position of use. In order to meet this requirement, chair arm-rests have already been proposed in which the arm-rest body is slidable along guides which enable the arm-rest body to move in a straight direction. However, this solution often is not acceptable from the aesthetic point of view because the sliding guides are visible in certain operating positions.

[0003] The object of the present invention is to provide a chair arm-rest which overcomes the above drawbacks.

[0004] According to the present invention, this object is achieved by a chair arm-rest having the features forming the subject of the main claim.

[0005] The present invention will now be disclosed in detail with reference to the attached drawings, given purely by way of non-limiting example, in which:

- figure 1 is a lateral schematic view of a chair having a pair of arm-rests according to the present invention,
- figure 2 is a cross-section taken along the line II-II of figure 1,
- figure 3 is a cross-section taken along the line III-III of figure 2,
- figure 4 is a cross-section taken along the line IV-IV of figure 1,
- figure 5 is an elevational view along the arrow V of figure 1,
- figure 6 is a plan view along the arrow VI of figure 5, and
- figures 7 and 8 are plan schematic views showing two different operative positions of the arm-rest according to the present invention.

[0006] In figure 1 the numeral reference 10 indicates a chair comprising a seat 12, a seat-back 14 and a pair of arm-rests 16, only one of which is visible in figure 1. Each arm-rest 16 comprises a supporting structure 18

and an arm-rest body 20.

[0007] As shown in greater detail in figure 4, the supporting structure 18 comprises a first tubular element 22 fixed to the seat 12 and a second tubular element 24 telescopically slidable with respect to the first one. The second tubular element 24 carries at its upper end a base plate 26 on which the arm-rest body 20 is mounted in the way which will be disclosed in detail in the following. A stop device 28 is provided for locking pin a desired position the second tubular element 24 with respect to the first tubular element 22. The stop device 28 comprises a pivoting member 30 extending inside the first tubular element 22 and articulated to the second tubular element 24 about an axis 32. The pivoting member 30 has a plurality of engagement seats 34 intended to cooperate with a locking pin 36 fixed to the first tubular element 22. The pivoting member 30 is fixed to an unlocking lever 38 which extends outside the second tubular element 24 and is positioned below the base plate 26. An elastic element (not shown) pushes the pivoting member 30 in the direction indicated by the arrow 30 and maintains one of the seats 34 engaged with the locking pin 36.

[0008] For adjusting the height of the arm-rest 10, the user pushes the unlocking lever 38 upwardly against the action of the elastic element. The upward movement of the unlocking lever 38 moves the pivoting member 30 to the position shown by dashed line in figure 4, in which the seats 34 are disengaged by the pin 36. In this condition the second tubular element 24 is free to slide with respect to the first tubular element 22. The user can therefore adjust the height of the arm-rest and lock the arm-rest in the desired position by simply releasing the lever 38. After releasing the lever 38, the elastic element brings the pivoting member 30 back in the position in which one of the seats 34 engages the locking pin 36.

[0009] With reference to figure 3, the arm-rest body 20 has a cavity 42 which is closed on its lower side by a bottom plate 44 fixed to the arm-rest body 20. A pair of pins 46 are carried by the base plate 26 of the supporting structure 18, the pins 46 being parallel to each other and having vertical axes. The pins 46 project from the upper surface of the base plate 26 and extend into the cavity 42 through respective arched apertures 47 formed in the bottom plate 44. With reference to figures 2 and 3, a pair of articulation plates 48 pivotally connected to the arm-rest body 20 by respective pins with vertical axes 50, are housed in the cavity 42. Each articulation plate 48 is also articulated about the axis of a respective pin 46.

[0010] The structure including the pins 46, the articulation plates 48, the pins 50 and the arm-rest body 20 forms an articulated quadrilateral device which enables the arm-rest body 20 to move laterally to the user. Figures 5 and 6 show by solid and dashed lines two operative positions of the arm-rest body 20. It can be seen that the arm-rest body 20 is movable parallel to itself in a substantially horizontal plane and offers to the user

the same rest surface in any operative position. The mechanism which enables the movement of the arm-rest body 20 is entirely contained within the arm-rest body and does not have any influence on the aesthetic appearance of the arm-rest.

[0011] With reference to figures 2 and 3, the articulated quadrilateral device can be associated with stop means defining one or more steady positions of the arm-rest. In the embodiment shown in the figures, such stop means comprise a series of positioning notches 52 formed on the periphery of an articulation plate 48. The notches 52 cooperate with a bush 54 of deformable material fixed to the arm-rest body 20 by means of a pin 56 with a vertical axis which could be integrally formed with the arm-rest body 20. The engagement between one notch 52 and the deformable bush 54 keeps the arm-rest body 20 in the same position until the user intentionally moves the arm-rest body to a new position.

[0012] As it has been previously disclosed with reference to figure 3, the bottom plate 44 which closes the lower part of the arm-rest body 20 is fixed to the arm-rest body 20 and therefore moves together with the latter. Consequently, for enabling the arm-rest body 20 to move freely along the path defined by the articulated quadrilateral device 46, 48, 50, it is necessary that the bottom plate 44 does not interfere with the pins 46 during the movement of the arm-rest body. For this purpose, the bottom plate 44 is provided with a pair of apertures 47 through which the pins 46 fixed to the base plate 26 of the supporting structure 18 extend. The apertures 47 have preferably an arched shape defined by the relative movement of the pins 46 with respect to the base plate 44 during the movement of the arm-rest body 20. The user could inadvertently hurt himself if he introduced a finger into one arched aperture 47 during the movement of the arm-rest body. For avoiding this problem, according to a preferred embodiment of the present invention, a pair of arched-shaped closure elements 58 are provided (figures 2 and 3) rotatably mounted about the pins 46, and arranged so as to close the apertures 47. As shown in figure 2, a rod 60 is articulated at its ends to the closure elements 58 and is also articulated to the articulation plates 48. In this manner, as shown in figures 7 and 8, during the movement of the arm-rest body 20 the closure elements 58 follow the movement of the articulation plates 48 and cover the arched apertures 47 in any position of the arm-rest body 20.

#### Claims

1. A chair arm-rest, comprising a supporting structure (18) an arm-rest body (20), and articulation means for movably connecting the arm-rest body (20) to the supporting structure (18), characterized in that said articulation means comprise a first pair of articulation axes (46) carried by the supporting structure (18), a second pair of articulation axes (50) carried by the arm-rest body (20) and a pair of articulation members (48) operatively associated with the first and second pair of articulation axes (46, 50) so as to form an articulated quadrilateral device which enables the arm-rest body (20) to move in a lateral direction to the user.
2. A chair arm-rest according to claim 1, characterized in that the arm-rest body (20) has a cavity (42) in which said articulation member (48) are housed.
3. A chair arm-rest according to claim 2, characterized in that the supporting structure (18) comprises a base plate (26) from which a pair of pins (46) project, said pins (46) defining said first pair of articulation axes and extending into said cavity (42).
4. A chair arm-rest according to claim 3, characterized in that said cavity (42) is closed on its lower side by a bottom plate (44) fixed to the arm-rest body (20), the bottom plate (44) being provided with apertures (47) through which said pins (46) extend.
5. A chair arm-rest according to claim 4, characterized in that it comprises a pair of closure elements (58) which cover said apertures (47) formed in said bottom plate (44), the closure elements (58) being rotatably mounted about said pins (46).
6. A chair arm-rest according to claim 5, characterized in that said apertures (47) have an arched shape corresponding to the relative path between the pins (46) and the bottom plate (44) during the movement of the arm-rest body (20), and in that said closure elements (58) are connected to said articulation members (48) so as to cover the arched apertures (47) in any position of the arm-rest body (20).
7. A chair arm-rest according to claim 1, characterized in that it comprises stop means (52, 54) associated with said articulated quadrilateral device, adapted to keep the arm-rest body (20) in at least one steady position.
8. A chair arm-rest according to claim 7, characterized in that said stop means comprise at least one positioning notch (52) formed on one of said articulation members (48) and cooperating with a deferrable stop element (54) carried by the arm-rest body (20).
9. A chair arm-rest according to claim 1, characterized in that said supporting structure (18) comprises a pair of tubular elements (22, 24) telescopically slidable with respect to each other and a stop device (28) adapted to lock in a plurality of operative positions the two tubular elements (22, 24) with respect to each other, the stop device (28) being provided with an unlocking lever (38) manually operable for

bringing the stop device (28) into an unlocking position, against the action of elastic means pushing the stop device (20) towards a locking position.

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Fig. 1

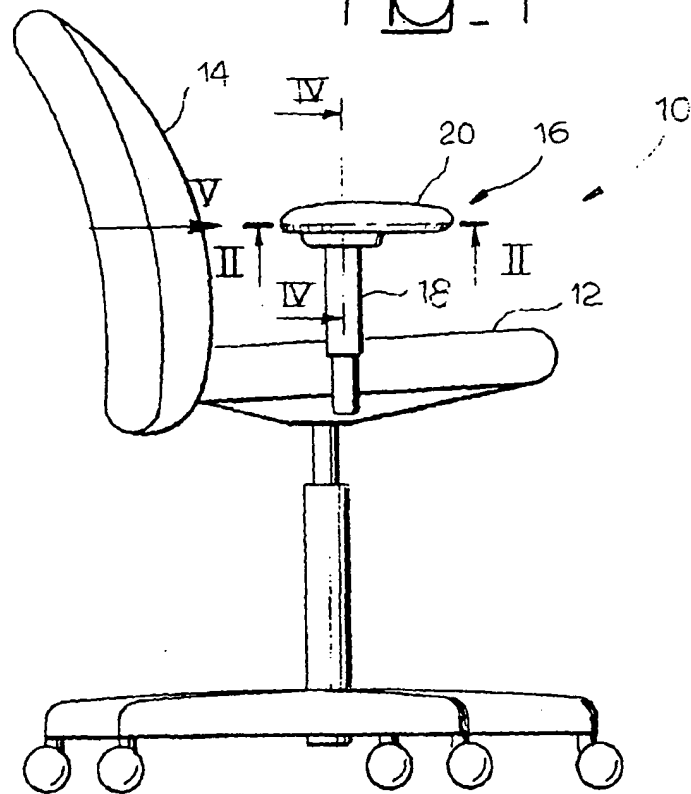
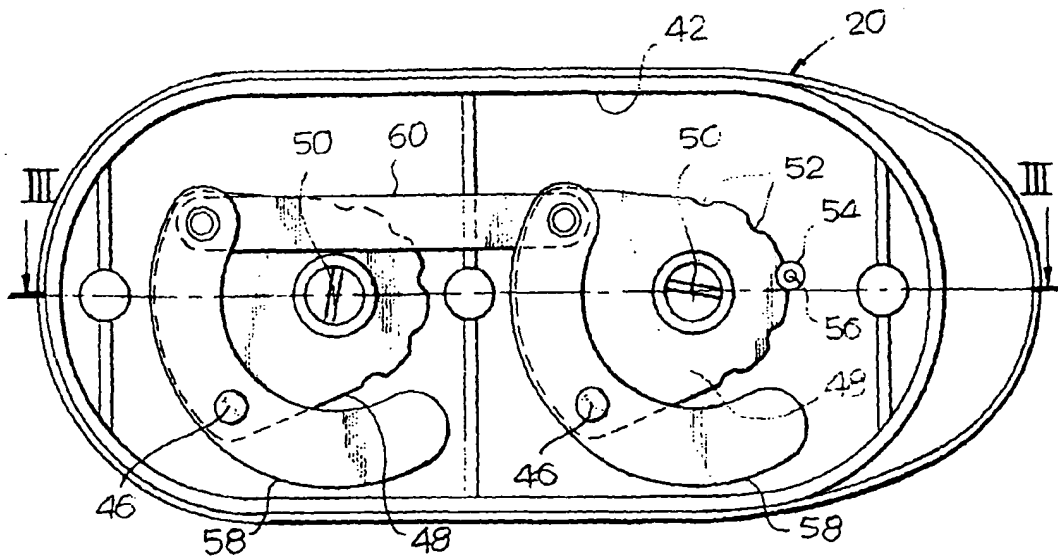
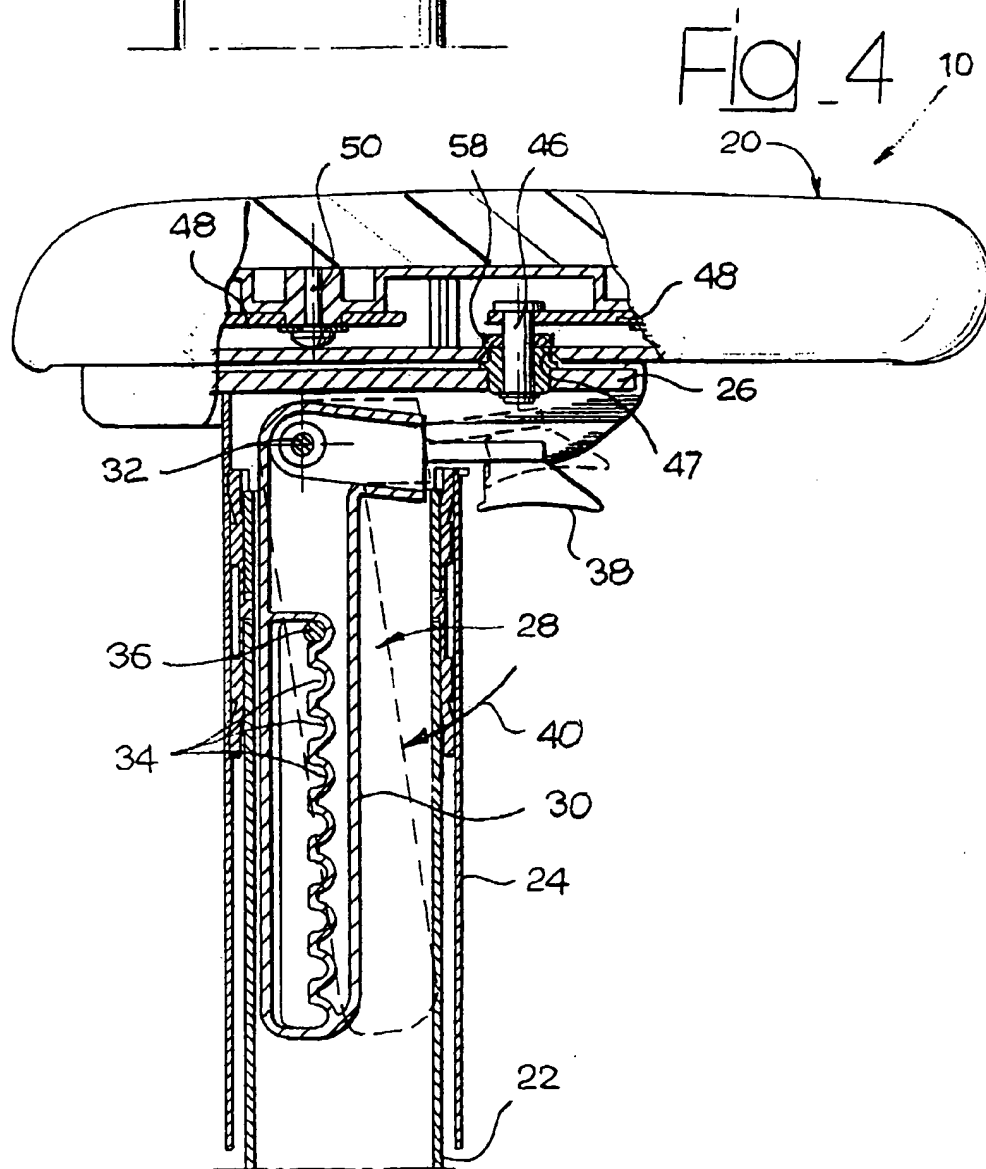
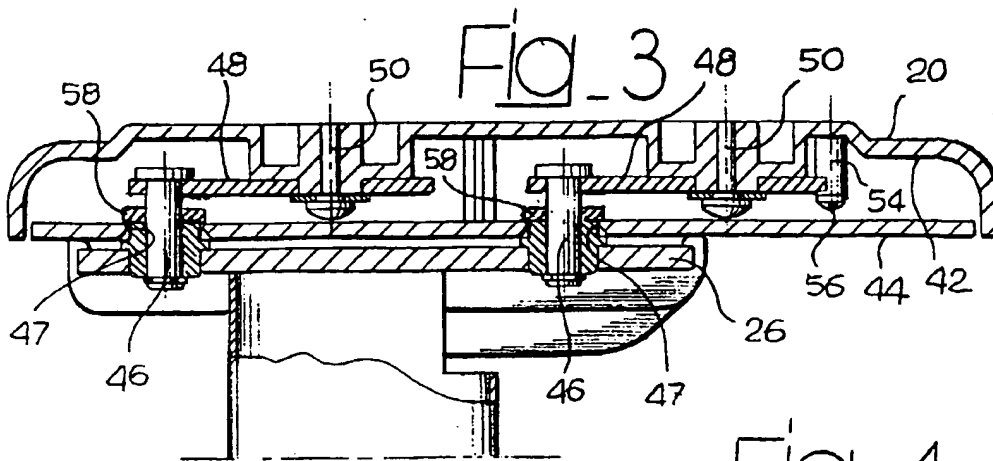


Fig. 2





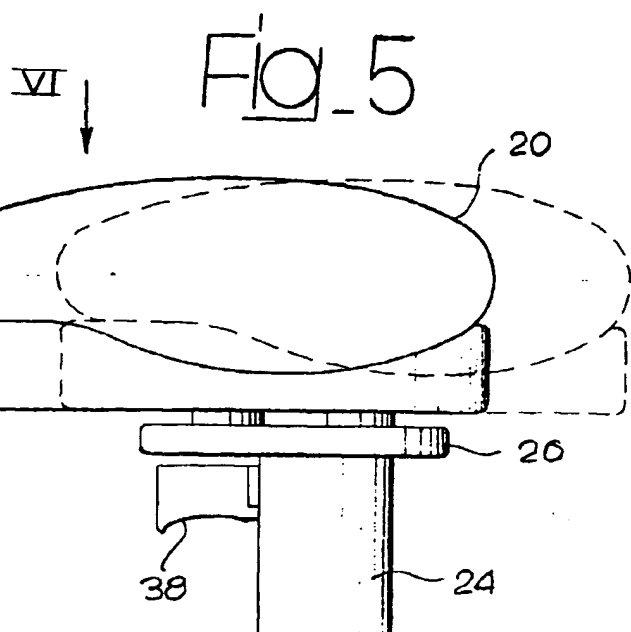


Fig. 6

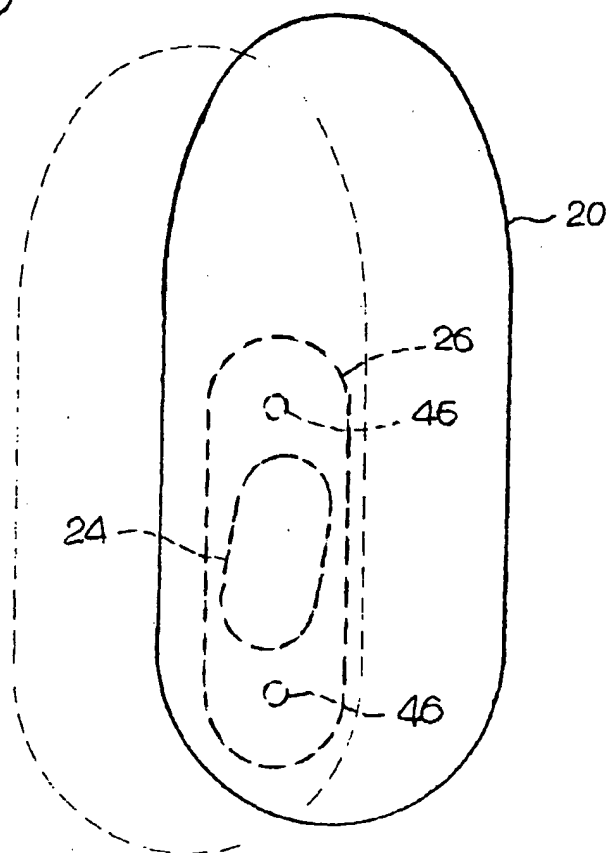


Fig. 7

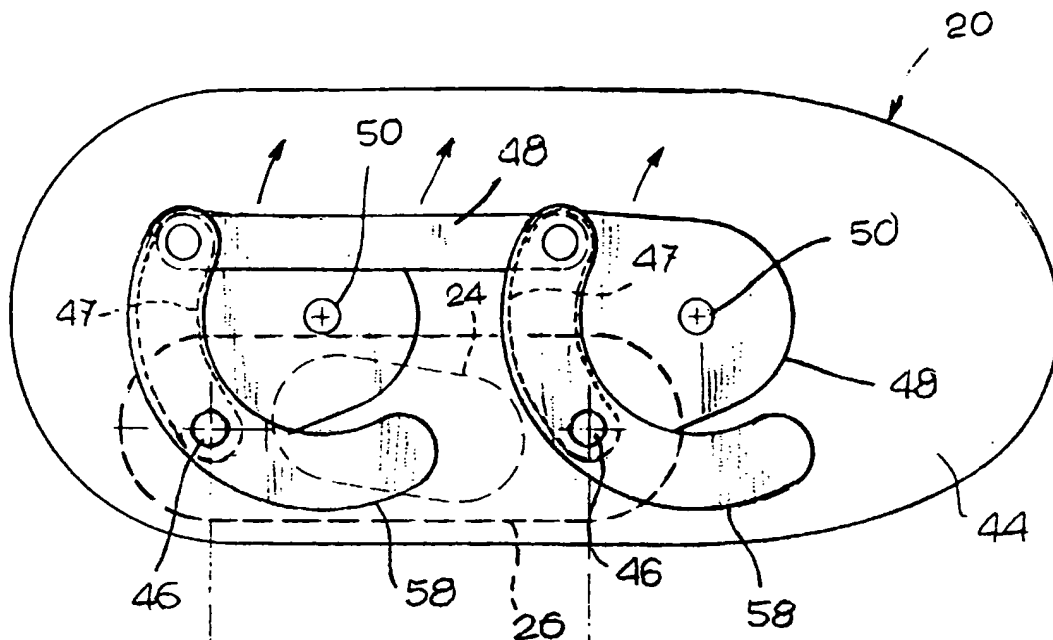
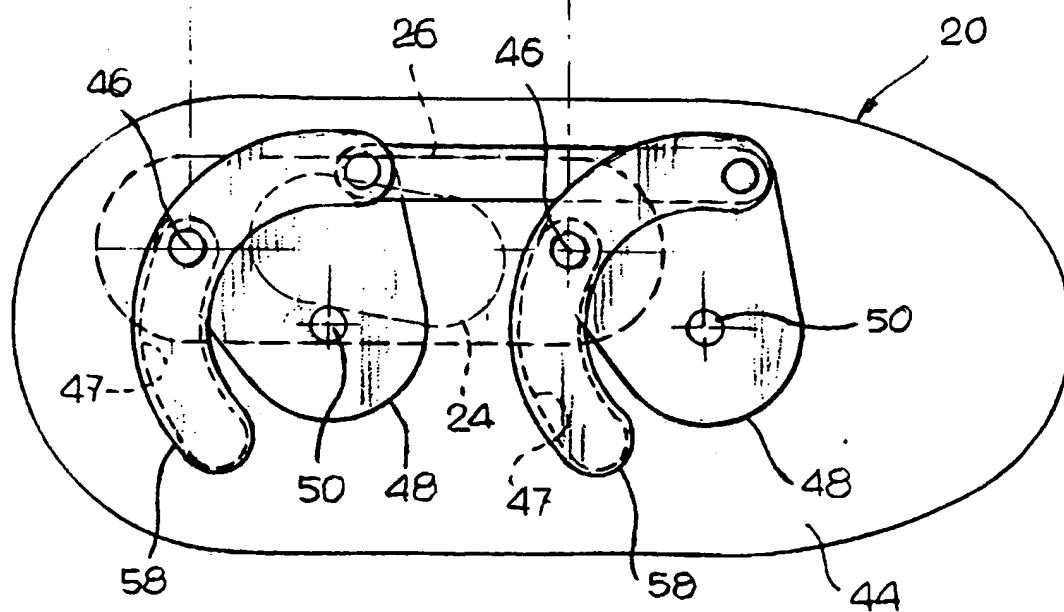


Fig. 8







European Patent  
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## EUROPEAN SEARCH REPORT

Application Number  
EP 99 11 0522

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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 8 October 1999	Examiner Amghar, N
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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08-10-1999

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